UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNITED STATES OF AMERICA,
THE COMMONWEALTH OF
PENNSYLVANIA, DEPARTMENT OF
ENVIRONMENTAL PROTECTION,
THE STATE OF INDIANA,
THE STATE OF WEST VIRGINIA, and
THE COMMONWEALTH OF PUERTO
RICO

Civil Action No. 2:11-cv-1650-DSC

Plaintiffs,

v.

ESSROC CEMENT CORP.,

Defendant.

DECLARATION OF HANS HARTENSTEIN

I, Hans Hartenstein, declare and state the following:

1. I have been involved in the business development, proposal engineering and estimating, project management, process and design engineering, component and equipment procurement, construction, erection, commissioning and start-up and operation of air pollution control equipment for utility and industrial power plants as well as waste incinerators (municipal waste, hazardous waste, sewage sludge, medical waste etc.) in a variety of capacities for over twenty five years.

2. I began my career in the field of air pollution control in 1983 as a staff engineer working for Mercedes-Benz in automobile engine development adapting standard type European automobile engines with catalytic converters, secondary air injection systems, flue gas recirculation systems etc. in order to comply with emission regulations in other countries.

3. In late 1987, I accepted a position with L&C Steinmüller GmbH in Germany, which was one of the leading engineering and equipment supply companies providing power utility boilers including the associated air pollution control equipment. Initially, my field of responsibility included business development for all environmental control technologies (air, water, waste) in Southern Germany. In 1990 I became Department Manager of the department of gas cleaning for waste incineration facilities. In 1993 I became General Manager for flue gas cleaning at L&C Steinmüller. Between 1988 and 1999, I was fully involved in retrofitting all waste incineration facilities regardless of the type of waste (municipal, industrial, hazardous, sewage sludge, medical etc.) with extensive flue gas cleaning systems for the removal of acid gases (SOx, HCl, HF), NOx, particulate matter (PM), heavy metals including mercury (Hg), cadmium (Cd), lead (Pb) and numerous others as well as dioxins (PCDD) and furans (PCDF). This retrofit phase started in Europe in the early 1990s and ended in the late 1990s.

4. On 1/1/1999 I took the position of Executive Vice President of KWH GmbH, at the time the world's largest manufacturer of honeycomb SCR catalyst concentrating on an effort to develop the North American SCR market. Besides several catalyst supply contracts for US utilities, I sold the first tail-end SCR DeNOx system in North America at KMS Peel in Mississauga, Ontario. In late 1999, I became a co-founder of E&EC – Energy & Environmental Consultants GmbH, an international engineering consulting company with offices in Germany and the U.S.

5. In 2000, I took over the environmental business unit of DB Riley, Inc. (later renamed Babcock Borsig Power, Inc. and now named Babcock Power, Inc.) in Worcester, Ma. In this position I was responsible for the SCR retrofits for the coal-fired units of American Electric Power (AEP), Detroit Edison (DTE), Duke Energy, Louisville Gas & Electric

(LG&E) and its subsidiaries Kentucky Utilities (KU) and Western Kentucky Energy (WKE), Northern Utilities (NU), Pennsylvania Power & Light (PP&L), Santee Cooper (SC), and We Energies (WE) as well as the development of the emerging markets for FGDs and Hg-removal technologies.

6. I left BBP shortly before the German parent company declared bankruptcy and focused on E&EC. Through E&EC I founded SCR-Tech in 2001 and served as President until 2005. SCR-Tech was dedicated to SCR management services including catalyst regeneration. In 2005 I accepted a position with Steag LLC, later renamed Evonik Energy Services LLC and currently named Steag Energy Services LLC and currently serve as the president. The company's focus is also SCR management services including catalyst regeneration.

7. Through E&EC I am currently assisting e.g. DOJ in their needs for expertise concerning the SCR and FGD technologies by fully utilizing my experience and expertise, which I developed over the past 25 years working as an engineer solely in the area of air pollution control systems for fossil fuel fired power plants, waste incineration facilities and industrial process facilities with a focus on FGDs and SCRs.

8. I am familiar with the design, operation and etc. of all types of SCR DeNOx systems including but not limited to tail-end and low temperature SCR DeNOx systems in the following industries:

   - power utility
   - waste incineration and biomass combustion
   - cement
   - steel
   - crematories

- glass

- reciprocating internal combustion engines

- chemical

- other high temperature processes generating high NOx emissions

9. The pilot scale system designed and run by Essroc under the CD, time period between January 2013 and July 2013, was designed in such a way that it could not meet 80% reduction for much longer than a few weeks. Anyone with sufficient skill and experience with SCR technology would have known that the unit would quickly fail to meet 80% reduction of NOx given the flue gas composition data. The system was designed in such a way that it was certain to fail within weeks because the:

    - SOx concentrations were unacceptably high upstream of the catalyst for the flue gas temperature present upstream of the catalyst.
    - Flue gas temperature was unacceptably low upstream of the catalyst for the SOx concentration present upstream of the catalyst.
    - The wrong type of catalyst was selected for the particulate loading still present downstream of the baghouse.
    - Too much particulate matter was left in the gas downstream of the baghouse for the type of catalyst selected.

    Prior to implementation of the pilot system, Essroc should have recognized these design defects provided they were working with parties skilled in the design and operation of SCR technology. It was clear prior to the pilot study that the low-temperature SCR DeNOx system was bound to fail within weeks as designed.

10. Reheating gas streams to levels necessary for the respective SO_2 and/or SO_3 concentrations in the flue gas in order to avoid ammonium bisulfate (ABS) fouling of the

catalyst has always been an integral part of tail-end SCR DeNOx systems. The first large scale tail-end SCR systems of this kind including flue gas reheating have been in operation since the mid 1980s.

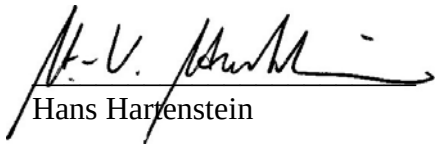
11. Reheating gas streams is not any more or less gas conditioning than ammonia injection and mixing, but rather a necessary and integral part of a functioning tail-end SCR system whenever the SO_2 and/or SO_3 content of the gas to be treated requires it. Flue gas reheating whenever necessary is as integral a part of a properly designed SCR DeNOx system as is the correct catalyst selection for the particular flue gas application.

12. In order for a full scale tail-end system to succeed at the Logansport kilns it would either have to have some sort of flue gas reheat or some sort of advanced SOx removal to avoid the detrimental formation and deposition of ABS on any type of catalyst. Likewise, it would have to have honeycomb or plate type catalyst for the particulate loading still present in the gas downstream of the baghouse in order to avoid pluggage of the catalyst.

13. Large tail-end SCR systems with flue gas reheat upstream of the SCR catalyst have been in operation since the mid 1980s and are well documented.

I, Hans Hartenstein, declare under the penalties of perjury that the foregoing is true and correct.

Executed on June 13, 2014



Hans Hartenstein